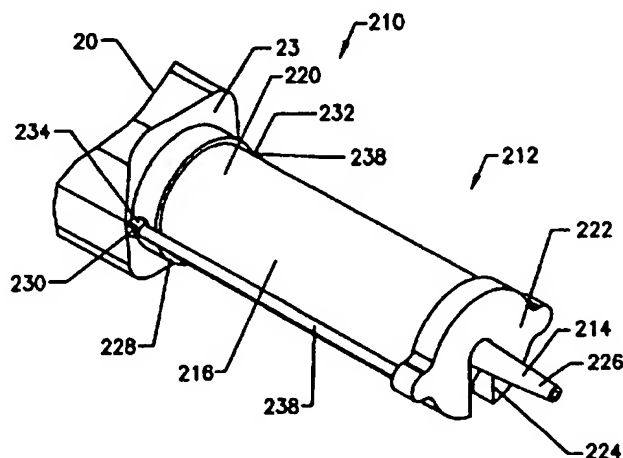


**PCT**WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau

## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>6</sup> :</b> <b>A61M 5/145, B05C 17/01</b>	<b>A3</b>	<b>(11) International Publication Number:</b> <b>WO 97/07841</b> <b>(43) International Publication Date:</b> 6 March 1997 (06.03.97)
<b>(21) International Application Number:</b> PCT/US96/13324 <b>(22) International Filing Date:</b> 19 August 1996 (19.08.96) <b>(30) Priority Data:</b> 08/519,201 25 August 1995 (25.08.95) US <b>(71) Applicant:</b> MEDRAD, INC. [US/US]; One Medrad Drive, Indianola, PA 15051 (US). <b>(72) Inventors:</b> REILLY, David, M.; 2318 Middle Road, Glenshaw, PA 15116 (US). UBER, Arthur, E.; 7426 Ben Hur Street, Pittsburgh, PA 15208 (US). HIRSCHMAN, Alan, D.; 101 Candlewyck Drive, Glenshaw, PA 15116 (US). GELBLUM, Eugene, A.; 327 Broadmoor Avenue, Mt. Lebanon, PA 15228 (US). <b>(74) Agents:</b> STUBENVOLL, Gretchen, Platt; Medrad, Inc., One Medrad Drive, Indianola, PA 15051 (US) et al.		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> <b>(88) Date of publication of the international search report:</b> 27 March 1997 (27.03.97)

**(54) Title:** FRONT LOAD PRESSURE JACKET SYSTEM WITH SYRINGE HOLDER**(57) Abstract**

A pressure jacket system of the invention is used to permit the front loading and removal of a syringe (214) from an injector (20), and includes a jacket cylinder (216) having an open front end (218) for receiving a syringe (214) and a rear end coupled to the injector front face (23), first and second tie rods (238, 240) having rear ends pivotally attached to the injector front face (23) by pivots and bushings (230, 234, 232, 236), and a front retaining plate (222) attached to the front ends of the first and second tie rods (238, 240), such that the retaining plate (222) and tie rods (238, 240) are pivotable between a closed position for holding the syringe (214) within the jacket cylinder (216) and an open position to allow the insertion and removal of the syringe (214) from the jacket cylinder (216).

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgyzstan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LI	Liechtenstein	SI	Slovenia
CI	Côte d'Ivoire	LK	Sri Lanka	SK	Slovakia
CM	Cameroon	LR	Liberia	SN	Senegal
CN	China	LT	Lithuania	SZ	Swaziland
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	LV	Latvia	TG	Togo
DE	Germany	MC	Monaco	TJ	Tajikistan
DK	Denmark	MD	Republic of Moldova	TT	Trinidad and Tobago
EE	Estonia	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	UG	Uganda
FI	Finland	MN	Mongolia	US	United States of America
FR	France	MR	Mauritania	UZ	Uzbekistan
GA	Gabon			VN	Viet Nam

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 96/13324

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 A61M5/145 B05C17/01

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 A61M A61C B05C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 964 139 A (KLEINMANN ET AL.) 22 June 1976 see column 2, line 6 - column 3, line 53 see figures 1-5 ---	1,4
X	US 5 078 698 A (STIEHL ET AL.) 7 January 1992 see column 3, line 7 - column 4, line 40 see column 5, line 21 - line 39 see figure 1 ---	5-7,9, 10,49
Y	US 4 723 948 A (CLARK ET AL.) 9 February 1988 see column 5, line 48 - column 6, line 59 see figures 1,2 --- -/--	5-15,50

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

3

Date of the actual completion of the international search

12 February 1997

Date of mailing of the international search report

21. 02. 97

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl,  
Fax (+ 31-70) 340-3016

Authorized officer

Schönleben, J

# INTERNATIONAL SEARCH REPORT

Int. onal Application No  
PCT/US 96/13324

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 336 189 A (SEALFON) 9 August 1994 see column 3, line 19 - line 57 see figures 1,4	5-15,50
A	---	2,3
X	US 5 400 925 A (SIMMEN) 28 March 1995  see column 9, line 7 - line 37 see figure 10	11-15, 49,50
A	---	
A	US 5 219 099 A (SPENCE ET AL.) 15 June 1993 see column 5, line 11 - line 68 see figures 1,2A,2B	5,49
X	---	
X	EP 0 092 607 A (TEROSON GMBH) 2 November 1983 see page 5, line 9 - page 6, line 23 see figures 1-4	16,18
A	---	19,21
A	DE 34 43 435 C (GALAC) 12 June 1986 see column 3, line 40 - line 47 see figure 1	24
X	---	
X	US 2 634 889 A (SHERBONDY) 14 April 1953 see column 3, line 70 - column 4, line 40 see figures 1-5	32,35
A	---	36,37
A	---	
A	US 3 997 085 A (LINDQUIST) 14 December 1976 see figures 1,2	32
A	---	
A	EP 0 279 922 A (SCHNEIDER) 31 August 1988 see column 3, line 10 - line 16 see figure 1	38,51
A	---	
A	US 4 695 271 A (GOETHEL) 22 September 1987  see column 1, line 58 - line 63 see figure 4	16,24, 32,38,51
	-----	

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 96/ 13324

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Subject No.1: Claims 1-4,5-10,11-15,49 and 50  
Subject No.2: Claims 16-23,24-31,32-37,38-44, and 51  
Subject No.3: Claims 45-48

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:  
  
Subject No.1: Claims 1-4,5-10,11-15,49 and 50  
Subject No.2: Claims 16-23,24-31,32-37,38-44, and 51
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.  
☒ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 96/13324

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-3964139	22-06-76	NONE	
US-A-5078698	07-01-92	AU-B- 643866 AU-A- 1014692 CA-A- 2059426	25-11-93 27-08-92 20-08-92
US-A-4723948	09-02-88	NONE	
US-A-5336189	09-08-94	DE-A- 4431184 GB-A- 2292524	07-03-96 28-02-96
US-A-5400925	28-03-95	CA-A- 2178483 EP-A- 0733198 WO-A- 9516187	15-06-95 25-09-96 15-06-95
US-A-5219099	15-06-93	NONE	
EP-A-92607	02-11-83	NONE	
DE-C-3443435	12-06-86	NONE	
US-A-2634889	14-04-53	NONE	
US-A-3997085	14-12-76	NONE	
EP-A-279922	31-08-88	DE-A- 3704210 US-A- 4865229	25-08-88 12-09-89
US-A-4695271	22-09-87	NONE	